λ_1
λ_2
λ_3
λ_4
λ_5
λ_6
λ_N

De
m
ux
/M

65_1
65_2
65_A
62
67_1
67_2
67_M

69_1
69_2
69_3
67

M
Bi-directional
ports

Fig. 1 - N wavelength, bi-directional port switch with M connections

tilt

~315

bulk lens
(asphere)

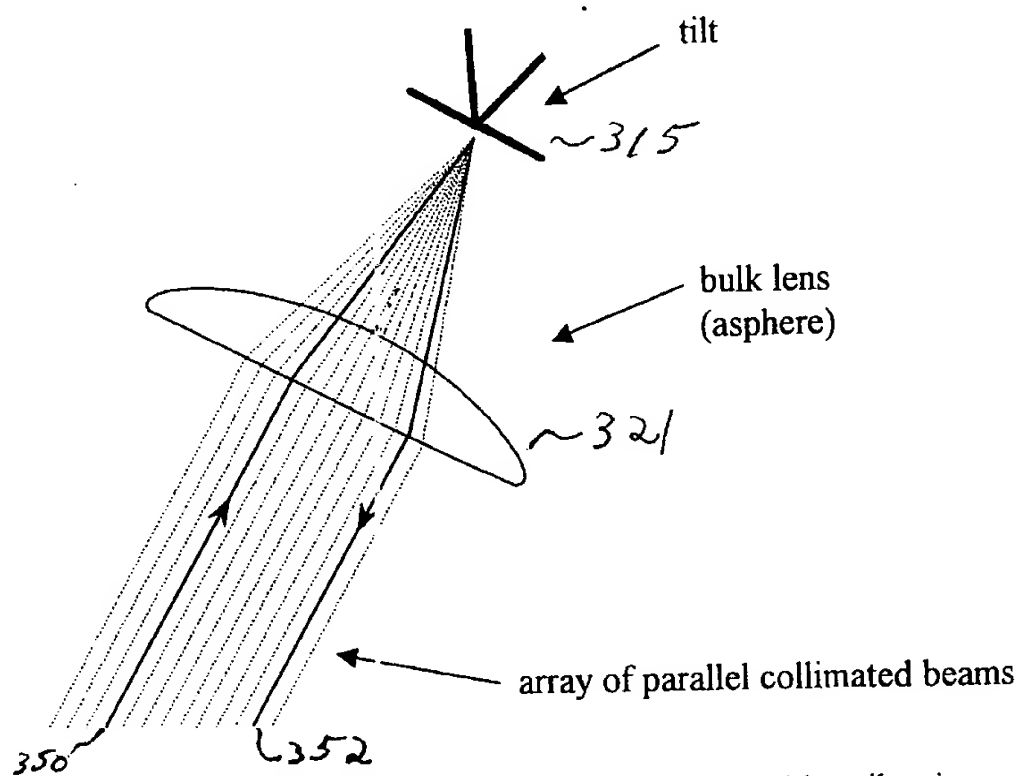~321

array of parallel collimated beams

350   ~352

Fig. 2 - Reflected translation of a collimated beam with a tilt mirror
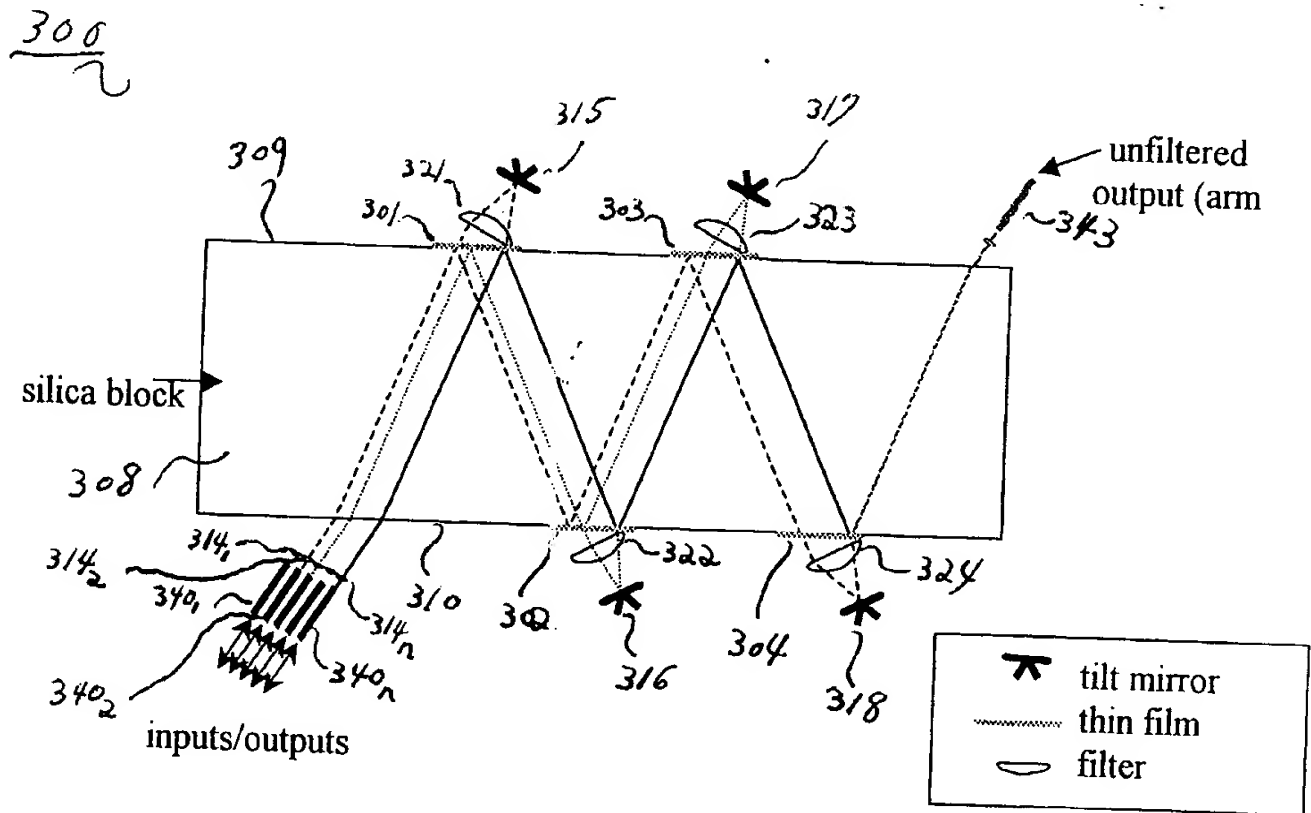
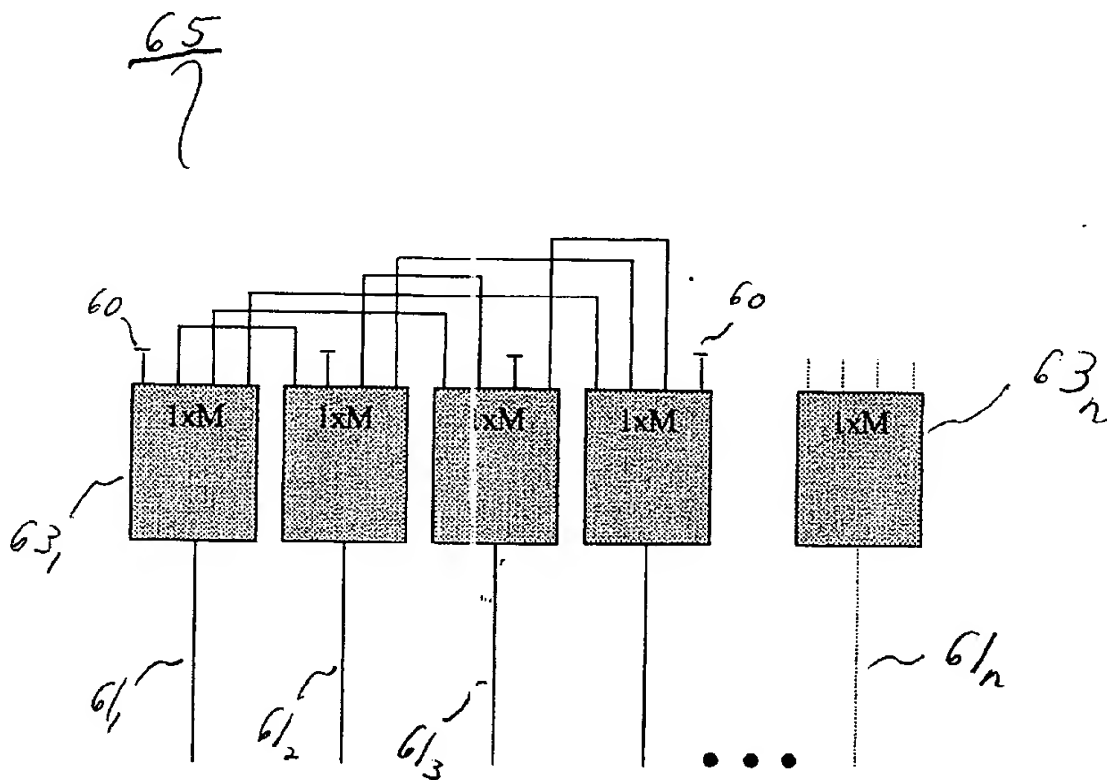Fig. 3 - Bidirectional inputs/outputs with independent wavelength distribution

$\frac{65}{}$

60

60

63_1

1xM 1xM xM 1xM 1xM 63_n

61_1 61_2 61_3 61_n

• • •

Fig. 4 – Switching fabric used in FIG. 1 to achieve
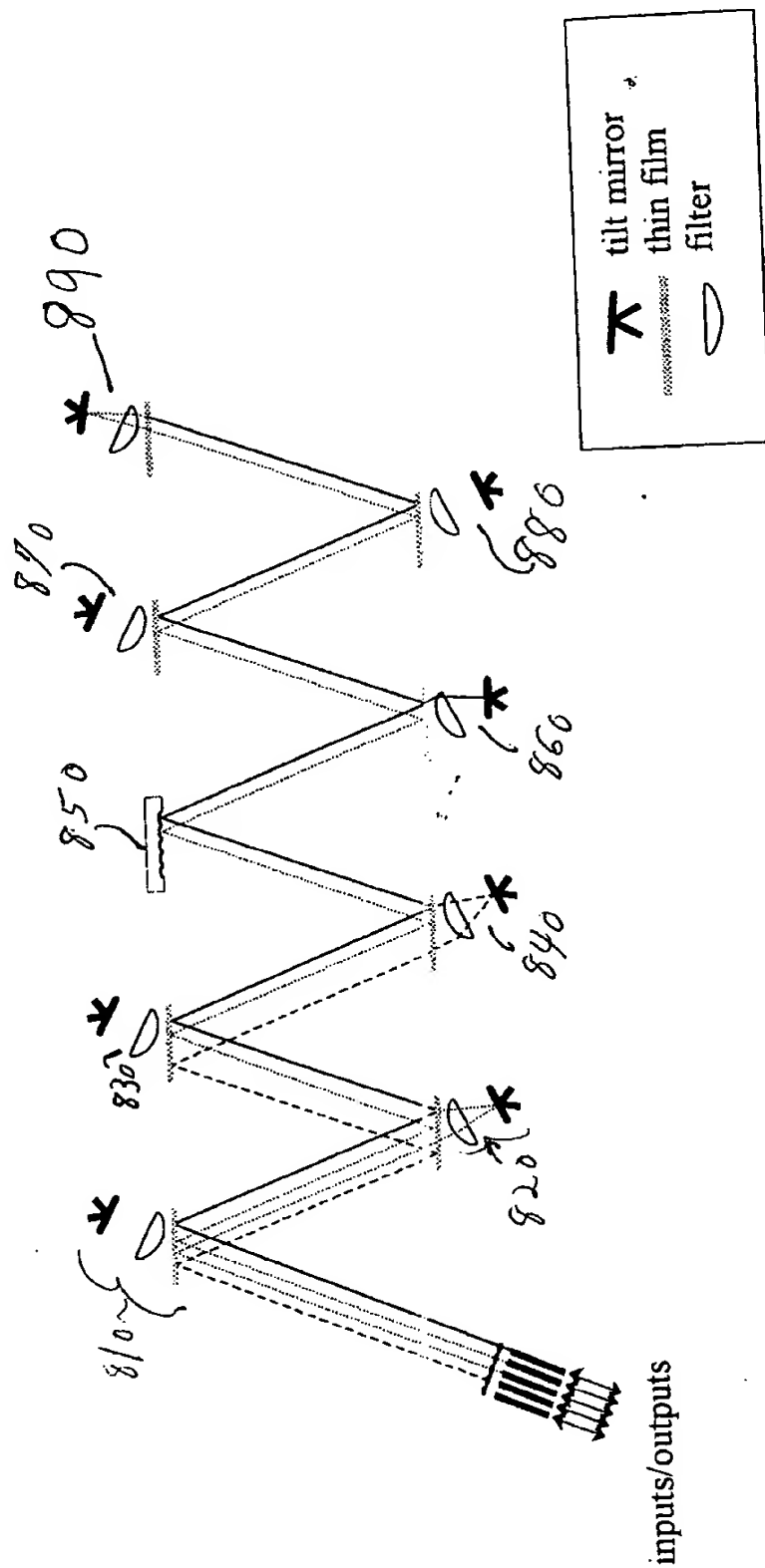desired functionality with conventional switches.

tilt

~52

correcting
lens (sphere)

~54

bulk lens
(asphere)

~50

array of parallel collimated beams

~56   ~58
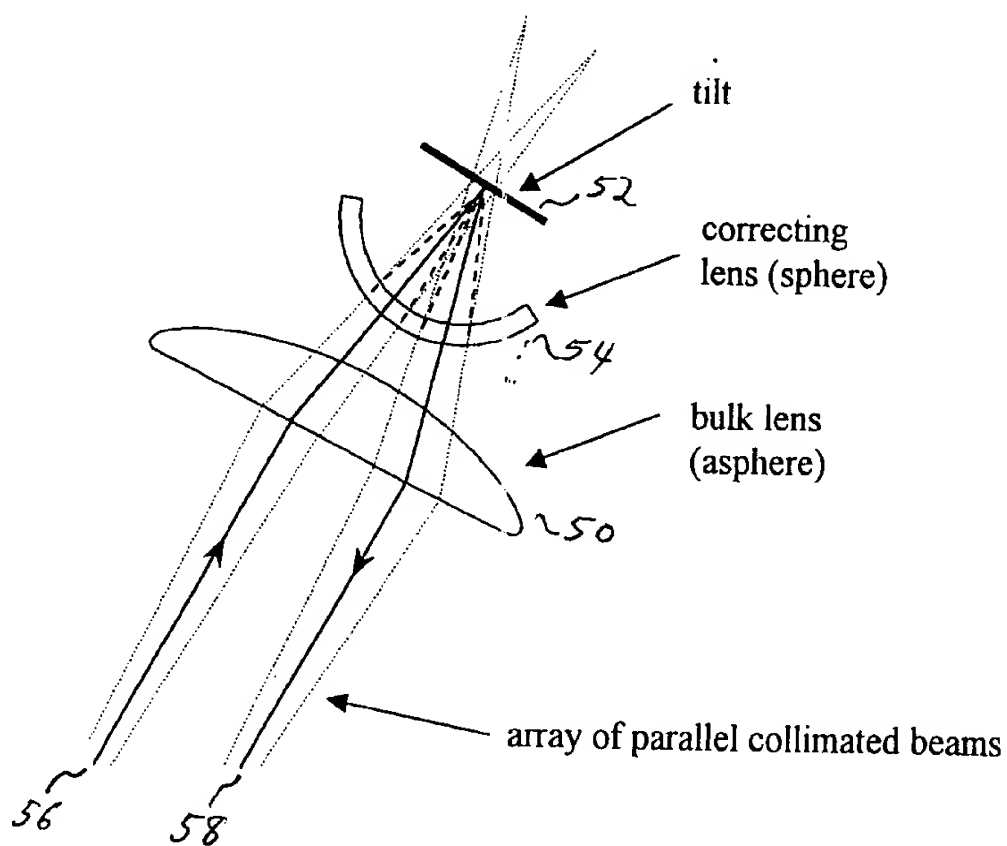
Fig. 5 - Corrected beam waist with a tilt

inputs/outputs

Fig. 16 - Extended wavelength fabric with beam recollimation

tilt mirror
thin film
filter

810 820 830 840 850 860 870 880 890
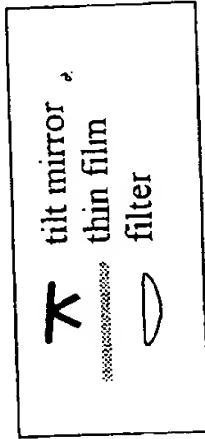
Fig. 7 - Extended wavelength fabric with banded structure

~615

~616

~617

~618

~619

629~

620~

silica block
600

inputs/outputs

tilt mirror
thin film
filter
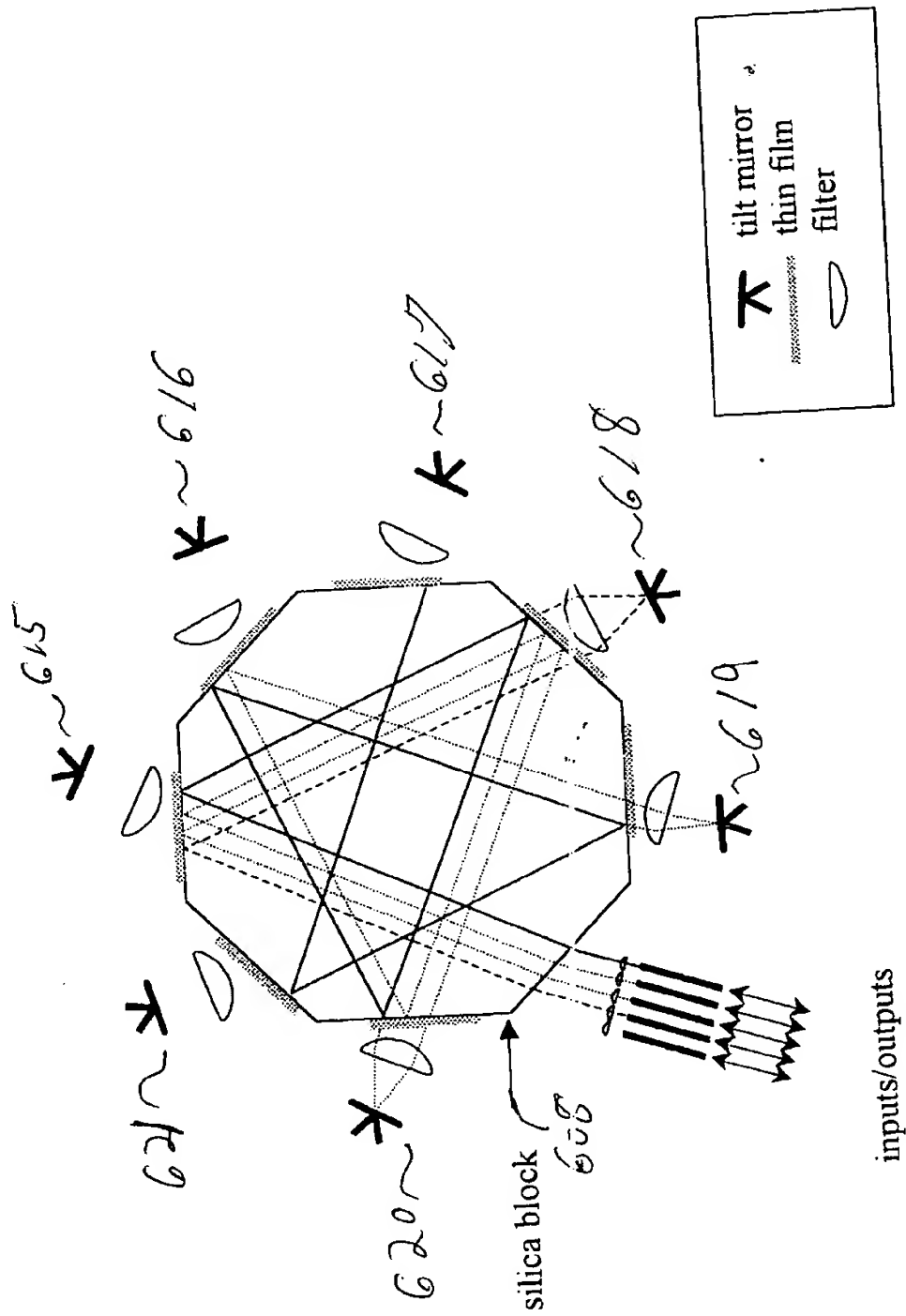
Fig. 8 - Bidirectional inputs/outputs with independent wavelength distribution in circular geometry